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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/711,080 | 08/20/2004 | Omer H. Dokumaci | FIS920040086US1 | 5079 |
| 29625 | 7590 | 07/13/2005 | EXAMINER | |
| MCGUIRE WOODS LLP 1750 TYSONS BLVD. SUITE 1800 MCLEAN, VA 22102-4215 | | | EVERHART, CARIDAD | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2891 | |

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|---------------------------------|---------------------------------|--|
| Office Action Summary | Application No. 10/711,080 | Applicant(s) DOKUMACI ET AL. | |
| | Examiner Caridad M. Everhart | Art Unit 2891 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-16, 18, 19, 21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-16, 18, 19, 21, 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Applicant's arguments with respect to ^{the}claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1-~~7~~⁹⁻¹⁶, 18, 19, 21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Kamata, et al. (US 2002/0063299A1) in view of Wu (US 2003/0107104) further in view of Nishinohara (US 6,465,842) and further in view of Chen et al (US 6,872,606).

Kamata, et al discloses the steps of forming a gate which at least partially overlaps source and drain regions 8 (paragraph 0056). The spacers can be seen to partially overlap regions 8 of the substrate in Fig. 2B(e), and the spacers are understood to be part of the gate. Kamata et al teaches an annealing step (paragraphs 0056 and 0090) which would result in diffusion of the implantation. A first step of material is formed adjacent a side of the gate, and a second step of material raised above the first step is formed remote from the side of the gate, as can be seen in the embodiment shown in Fig. 7(b) and in 7(c), the material in the undercut is the first step and the material in the second step which is at a distance from the sidewall is higher than the material in the first step. (Fig. 7(b) and 7(c) and paragraphs 0075 and 0076). The material of layer 8 is epitaxially grown Si (paragraph 0074). The layer is grown from a growth step (paragraph 0074). The spacers are formed by anisotropic etch (paragraph 0050). The undercut is formed by a DHF etch (paragraph 0075), which is an isotropic wet etch. The first step is formed in the undercut, as pointed out above. The second step is formed next to the sidewall spacers, as is pointed out in the portions of Kamata, et al cited above. There is also disclosed a raised source/drain (paragraphs 005 and 0056) which is epitaxially grown in one step. There is a silicidation step (paragraph 0097). Fig. 2B(a) shows portions 8 which are source/drain portions of the substrate and are therefore made

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conductive. Fig. 7a shows that the first step contacts part of that region. Silicide may be formed on the source/drain regions(paragraph 0106), and therefore may be formed on the second step, which is the portion of the source/drain regions which are exposed to the silicidation step.

Kamata does not state that the diffusion region extends under the gate, although the anneal steps would result in this extension. Kamata does not teach the first and second step of material with the second step raised above the first step and remote from the gate.

Wu teaches that the extension implantation and anneal results in diffusion region extending under the gate (paragraphs 0004, 0030, and 0033).

It would have been obvious to one of ordinary skill in the art at the time of the invention that the diffusion in the process taught by Kamata extends under the gate because Wu teaches that the anneal step taught by Kamata would result in the diffusion under the gate.

Nishinohara teaches that the shape of the raised source and drain can be controlled in order to obtain desired device characteristics(col. 4,lines 65-67 and col. 5,lines 1-7; col. 15, lines 15-25 and col. 16,lines 17-29).

Chen et al discloses that whether the surfaces of the epitaxial material is curved or faceted, which would result in stepped shape, is the conditions of the deposition.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the raised source/drain structure in the process taught by

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Kamata in a shape in which a portion that is remote from the gate is raised as taught by Nishinohara, and it would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the sloped portion in the form of a step rather than a sloped portion because Chen et al teaches that the portion can be formed to be either curved or faceted depending upon the deposition conditions.

Kamata, et al is silent with respect to the recited dimensions. It would have been obvious to one of ordinary skill in the art at the time of the invention to have chosen the recited dimensions for the height of the conductive regions because these are variables of the art which one of ordinary skill in the art would have been able to determine.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Everhart

7-11-2005

C. Everhart

CARIDAD EVERHART
PRIMARY EXAMINER